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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/771,636

02/05/2004

Kunihiro Onoda

01-548

4115

23400

7590

09/27/2006

POSZ LAW GROUP, PLC  
12040 SOUTH LAKES DRIVE  
SUITE 101  
RESTON, VA 20191

EXAMINER

TAMAI, KARL I

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/771,636	Applicant(s) ONODA ET AL.	
	Examiner Tamai I.E. Karl	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-9 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 05 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☒ All b) ☐ Some \* c) ☐ None of:  
 1. ☒ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
2. The amended title of the invention, "Electrostatic Actuator Including a Mirror Surface" is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Drawings***

3. The objection to the drawings under 37 CFR 1.83(a) is withdrawn.
4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the thickness of the fixed combs being greater than the movable structure must be shown or the feature canceled from the claim. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure

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is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The thickness of the fixed side comb tooth electrode is greater than the movable structure, where the movable structure is the torsion beam and the movable side comb tooth electrode.

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7. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The "a thickness" of the fixed side electrodes is vague and indefinite. It is unclear from the specification and drawings, what the Applicant considers to be the thickness of the comb tooth electrode.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behin et al. (Behin)(US 2001/0034938) and Conant et al. (Conant)(US 6758983). Behin

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teaches a laminated electrostatic actuator in a bore having a silicon electrodes layers 202, 204 (or metal) separated by a silicon oxide layers 208, 210 mounted on a silicon substrate 206. Behin teaches every aspect of the invention except the electrodes on opposite sides of the beam and the thickness of the fixed electrodes being greater than the movable structure, and the sets of electrodes being 3 or more pairs. Conant teaches the fixed electrodes can be formed in both layers of the fixed electrodes (figures 7 and 8), such that the fixed side electrodes are twice as thick (tall) as the moving electrodes and on both sides of the beam to control rotation. Conant teaches four pairs along the spine 34. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Behin electrodes on opposite sides of the torsion beam and vertically thicker than the moving structure to provide improved control, such as resonance frequency tuning and bidirectional scanning, as taught by Conant.

11. Claims 1, 3, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Costello et al. (Costello)(US 6628856) and Conant et al. (Conant)(US 6758983). Costello teaches a laminated electrostatic actuator in a bore having a silicon electrodes layers 602 separated by an insulating silicon dioxide layers and mounted on a silicon substrate (figures 19 and 20). The actuator can be used in conjunction with capacitor sensor plates (figure 17) for driving the actuator. Costello teaches every aspect of the invention except the electrodes at the torsion beam, the electrodes on opposite sides of the beam, the thickness of the fixed electrodes being greater than the movable

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structure, and the sets of electrodes being 3 or more pairs. Conant teaches the fixed electrodes at the beam that can be formed in both layers of the fixed electrodes (figures 7 and 8), such that the fixed side electrodes are twice as thick (tall) as the moving electrodes and on both sides of the beam to control rotation. Conant teaches four pairs along the spine 34. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the actuator of Conant electrodes on opposite sides of the torsion beam and vertically thicker than the moving structure to provide improved control, such as resonance frequency tuning and bidirectional scanning, as taught by Conant.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behin et al. (Behin)(US 2001/0034938) or Costello et al. (Costello)(US 6628856) in combination with Conant et al. (Conant)(US 6758983), in further view of Miller et al (Miller)(US 6000280). Behin or Costello and Conant teach every aspect of the invention except the comb electrodes being parallel to the torsion spring and extending half or more the length of the beam. Miller figure 11 shows the comb actuator 170 electrodes extending parallel to the beam and suggests from the figure that the electrodes are more than half the length of the beam 16 (from the anchor to the cross beams of the rotor arm 12). It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the motor of Behin or Costello and Conant with the combs on the actuator of Miller provided enhanced control of moving plate.

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13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behin et al. (Behin)(US 2001/0034938) or Costello et al. (Costello)(US 6628856) in combination with Conant et al. (Conant)(US 6758983), in further view of Lee et al. (Lee)(US 5780948). Behin or Costello and Conant teach every aspect of the invention except the comb electrodes being different in the vertical direction. Lee teaches the comb electrodes being different lengths in the direction of movement. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the motor of Behin or Costello and Conant with the combs of different height because Lee to provide effective stiffness control in the actuator.

14. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behin et al. (Behin)(US 2001/0034938) or Costello et al. (Costello)(US 6628856) in combination with Conant et al. (Conant)(US 6758983), in further view of Jain et al. (Jain)(US 6312134). Behin or Costello and Conant teach every aspect of the invention except the movable structure swung in synchronization with the intermittent radiation period of a laser and a laser beam directed at a distant object. Jain teaches an electrostatic micromirror with a controller 7 that synchronizes the mirror with the pulsed laser directed to a stage for a lithograph device. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the motor of Behin or Costello and Conant with the movable structure swung in synchronization with the intermittent radiation period of a laser and directed at the stage to provide a controllable maskless lithography system, as taught by Jain.



***Response to Arguments***

15. Applicant's arguments filed 7/17/2006 have been fully considered but they are moot in view of the new ground of rejection. Applicant's arguments that the combs of Behin are connected to the moving member 36 is not persuasive because they are still "at" the flexure.

***Conclusion***

16. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (571) 272 - 2036.

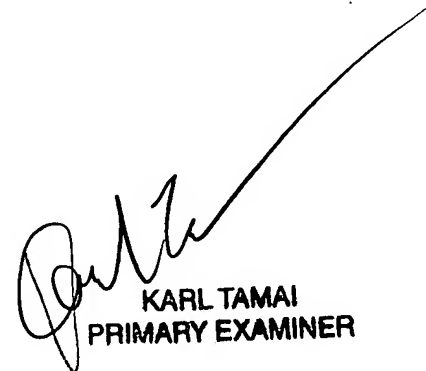
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The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Darren Schuberg, can be reached at (571) 272 - 2044. The facsimile number for the Group is (571) 273 - 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karl I Tamai  
PRIMARY PATENT EXAMINER  
September 21, 2006

6758983  
6713367  
6686639  
6872319  
6,628,856  
6,643,053  
6,000,280  
5,780,948  
6,312,134  
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